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Experiments on the induced breeding of milkfish, *Chanos chanos* (Forsskal) in 1978

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In the Philippines, early attempts to induce the wild adult milkfish to breed in captivity by hormone injection were not successful (Angeles, 1968; Anon., 1974; Delmendo and Angeles, 1975). Injection of the partially purified salmon gonadotropic hormone (SG-G100) to captive and wild adult milkfish resulted in the release of hydrated eggs (Nash and Kuo, 1976; Vanstone et al., 1976); the eggs, however, were not fertilized. In 1977, newly caught adult milkfish were induced to ovulate by injecting them with a mixture of acetone dried pituitary gland of salmon and human chorionic gonadotropin and the stripped eggs were successfully artificially fertilized (Vanstone et al., 1977). A similar attempt by Chaudhuri and Juario (1977) was not successful because the fish died 14 hours after the second injection. This paper summarizes the results of the experiments conducted on the induced breeding of wild adult milkfish during the 1978 season.

Milkfish spawners caught in the fish corrals near the Tigbauan Station were transported in cages towards the shoreline (Chaudhuri et al., 1978). They were sexed by examining the gametes obtained by inserting a cannula through the region of the urogenital papilla. The developmental stage of the eggs was determined from the mean diameter of 20 eggs exteriorized through the cannula. The spawning agents used for these experiments were:

SPH — acetone-dried pituitary gland homogenate of coho salmon prepared by the British Columbia Research Council at Vancouver, Canada; one gram of the powder contains 17.6 mg gonadotropin.

HCG — human chorionic gonadotropin, counted in International Units, manufactured by Ayerst Laboratories in New York.

For the induced breeding experiments, SPH was either used singly or in combination with HCG.

The response of newly caught spawners to the hormone injections is presented in Table 1. Results indicate that a female having eggs with an average diameter less than 0.7 mm did not respond well to the hormone injections. Apparently, also the use of SPH alone is not very effective in inducing ovulation. One fish was successfully induced to ovulate in captivity by injecting a total of 273 mg SPH + 17.600 I,U, HCG. The eggs were stripped and fertilized but the fertilization rate was less than 1% and the eggs developed only up to the blastula stage. Liao et al, (1979) used a semilar dose per kg body weight and successfully induced a female to ovulate in captivity. However, the total dose used (84 mg SPH + 7,000 I.U. HCG) for one fish was much lower since the fish was stripped of its eggs about 12 hours after the second injection; the fertilization rate was 38%. Vanstone et al., (1977) were successful in inducing ovulation in two females by using respectively a total dose of 150 mg SPH + 10,000 I.U. HCG and 240 mg SPH + 16,000 I.U. HCG. The stripped eggs were fertilized but the fertilization rates were not determined. The data gathered to date are still insufficient to be able to conclude which dose is effective in including ovulation in newly caught adult milkfish. From the present results, however, it is evident that the response of fish to hormone injection is greatly affected by their physical condition during capture and acclimatization. Apparently, females having eggs with a mean diameter of less than 0.7 mm, do not respond well to the hormone injections.

Table 1. The Response of Spawners to Hormone Injection

Fish No.	Estimated (Actual) Body Weight (Kg)	Initial Egg Diameter (mm)	Injection		Date and time of injection	Remarks and observations
			Total SPH (mg) † HCG (IU)	Per kg body weight		
1	8 (7.6)	0.525 (N=20)	**1st** 120 + 0 **2nd** 120 + 0 **3rd** 240 + 0 **4th** 240 + 0	15 + 0 15 + 0 30 + 0 30 + 0	4/30/78 – 1800 hrs. 5/1/78 – 0530 hrs. 5/1/78 – 1800 hrs. 5/2/78 – 0730 hrs.	Fish caught from the fish corral was badly injured before it was transported to the canvas tank; increase in average egg diameter between succeeding injections was very small; fish died 12 hours after the 4th injection and the average egg diameter was only 0.580 mm (N= 20).
2	10 (10.2)	0.84 (N=20)	**1st** 60 + 4,000 **2nd** 90 + 6,000	6 + 400 9 + 600	4/30/78 – 1830 hrs. 5/1/78 – 0630 hrs.	Fish was badly injured when brought to the canvas tank; a lot of scales were taken out; the fish died a few minutes after the second injection.
3	8 (7.9)	8.78 (N= 20)	**1st** 80 + 0 **2nd** 120 + 0 **3rd** 120 + 0	10 + 0 15 + 0 15 + 0	5/1/78 – 0635 hrs. 5/1/78 – 1835 hrs. 5/2/78 – 0705 hrs.	Fish was moderately injured; 8 hrs after the 2nd injection a running male was placed in the tank together with the female; at about 0600 hrs partially hydrated eggs with an average diamenter of 0.98 mm (N= 15) were released; the remaining eggs exteriorized through a cannula were examined again 8 hrs after the 3rd injection but the mean diameter remained the same i. e. 0.98; the fish was then sacrified; only very few eggs were left.
4	7 (6.3)	0.71 (N = 20)	**1st** 70 + 0 **2nd** 105 + 0 **3rd** 105 + 0	10 + 0 15 + 0 15 + 0	5/2/78 – 0800 hrs. 5/2/78 – 2000 hrs. 5/3/78 – 0800 hrs.	Fish was relatively in good condition; 9 hours after the 3rd injection, egg samples were taken and examined under the microscope; the eggs were irregular in shape and were very transparent; furthermore there were signs of atresia; at 0120 hours on 5/4/78, the fish died.
5	8 (9.2)*	–	**1st** 48 + 3,200 **2nd** 72 + 4,800 **3rd** 72 + 4,800 **4th** 72 + 4,800	6 + 400 9 + 600 9 + 600 9 + 600	5/6/78 – 0600 hrs. 5/6/78 – 1400 hrs. 5/6/78 – 2200 hrs. 5/7/78 – 0700 hrs.	The fish caught was in good condition; the fish was stripped of its eggs 3 hours after the 4th injection since hydrated eggs were partially released; eggs were fertilized by the dry method by sperms of uninjected males; fertilization rate was less than 1% and the eggs developed only up to the blastula stage.

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